CLAIMS

1. Thermal destruction process for at least one organic or halogenated organic product in liquid, gaseous or powder form, with the process involving the following steps:

- mixing:
  - of the aforementioned one or more organic products with water in sufficient quantities to ensure that at least stoichiometric ratios between atoms of carbon and oxygen in the mixture are obtained,

    or
  - of the aforementioned one or more halogenated organic products with water in sufficient quantities to ensure that at least the stoichiometric ratios for, on the one hand, atoms of carbon and oxygen in the mixture, and on the other hand, for hydrogen and halogen atoms in the mixture are obtained,
- introduction of this mixture and of plasmagenic gases into the coil (26) of an inductively coupled plasma torch (6) to produce gas in which decomposition into atomic elements has occurred,
- an initial thermal destruction operation of the aforementioned gas in which decomposition into atomic elements has occurred, this initial destruction operation taking place in a reaction chamber (7),
- a second thermal destruction operation of the gas that has undergone the initial destruction operation, this second destruction operation taking place in a

stirring device (8) with no energy being added, this gas which undergoes the second thermal destruction operation being stirred with air and/or oxygen,

- recombination by cooling (10) of at least a part of the gas emerging from the stirring device (8),
- discharge (20) of the gas that has been destroyed.

2. Thermal destruction process as in the previous claim, characterised in that the mixture of the at least one organic product or halogenated organic product with water is introduced at the coil (26) of the inductive plasma torch (6) in the form of a spray if the aforementioned organic product or halogenated organic product is in a liquid or powder form, or in a gaseous form if the aforementioned organic or halogenated organic product is in gaseous form.

3. Thermal destruction process as in claim 1, characterised in that the stirring device (8) is a venturi.

4. Thermal destruction process as in claim 1, characterised in that it further includes a cooling step for the gas emerging from the step of recombination by cooling (10) in a device (17) which allows heat to be exchanged with the surroundings.

5. Thermal destruction process as in any of claims 1 or 4, characterised in that it further comprises an analysis (12) step of the gas emerging from the step of recombination by cooling (10).

6. Thermal destruction process as in any of claims 4 or 5, characterised in that it further comprises a gas pressure regulation step.

7. Thermal destruction process as in the previous claim, characterised in that the regulation step is carried out using a pumping device (18) referred to as the vacuum plant.

8. Thermal destruction process as in any one of the previous claims, characterised in that it comprises at least one chemical treatment step for gas emerging from the step of recombination by cooling.

9. Thermal destruction process as in the previous claim, characterised in that the at least one chemical treatment step for gas is a step selected from amongst de-halogenation (14), deoxidation of nitrogen oxide (16) and desulphurisation.

10. Thermal destruction process as in any of claims 8 or 9, characterised in that a spray of water (13) on the gas is carried out before the chemical treatment step of the aforementioned gas is carried out.

11. Thermal destruction device for one or more organic products or halogenated organic products in liquid, gaseous or powder form, comprising :
- an inductively coupled plasma torch (6),

- means of introducing plasmagenic gases into the aforementioned torch (6),
- means (23, 23') of introducing a mixture of water and the said one or more organic products or halogenated organic products into the aforementioned torch,
- a reaction chamber (7) suitable for the thermal destruction of gas emerging from the inductively coupled plasma torch (6),
- a device (8) used to carry out the stirring of the gas emerging from the reaction chamber (7),
- means of introducing air and/or oxygen (9) into the stirring device (8),
- a device (10) that allows recombination by cooling of at least a part of the gas emerging from the stirring device,

with the inductively coupled torch (6) being connected to the reaction chamber (7), which is connected to the stirring (8), which is in turn connected to the recombination device (10).

12. Thermal destruction device as in the previous claim, characterised in that it comprises means for cooling the inductively coupled plasma torch, the reaction chamber, the stirring device and the recombination device.

13. Thermal destruction device as in the previous claim, characterised in that the aforementioned means of cooling is a cooling plant (11).

14. Thermal destruction device as in any of claims 11 or 12, characterised in that the reaction chamber (7) comprises a double wall (28) in which cooling water circulates.

15. Thermal destruction device as in the previous claim, characterised in that the internal surface of the double wall (28) is covered with a refractory material.

16. Thermal destruction device as in claim 11, characterised in that the introduction of plasmagenic gas into the torch is achieved using over-pressurisation.

17. Thermal destruction device as in claim 11, characterised in that the means for introducing a mixture of water and waste into the torch is a spray probe (23) if the mixture is in the form of a liquid or suspension, or is an injection probe (23') if the mixture is in gaseous form.

18. Thermal destruction device as in claim 11, characterised in that the stirring device (8) used to achieve stirring of gas is a venturi.

19. Thermal destruction device as in the previous claim, characterised in that the venturi has a water-cooled double wall.

20. Thermal destruction device as in any of claims 18 or 19, characterised in that the venturi includes an upper part, called the convergent (34), a lower part, called the divergent (42), and a central part, known as the neck (38), which connects the convergent (34) and the divergent (42), and air inlet ports.

21. Thermal destruction device as in the previous claim, characterised in that the venturi includes at least one means (37) for uniformly distributing air onto the venturi walls.

22. Thermal destruction device as in the previous claim, characterised in that the at least one means for uniformly distributing air onto the venturi walls is a distribution chamber (37, 40) which includes holes arranged around its perimeter.

23. Thermal destruction device as in claim 11, characterised in that the device (10) used for recombination by cooling of at least a part of the gas emerging from the stirring device (8) is a water-cooled double walled enclosure.

24. Thermal destruction device as in any one of claims 11 to 23, characterised in that it further includes a device (17) for exchanging heat with the surroundings and/or a device (18) for regulating the pressure inside the destruction device.

25. Thermal destruction device as in the previous claim, characterised in that the device (18) used to regulate pressure is a vacuum plant.

26. Thermal destruction device as in any one of claims 11 to 25, characterised in that it further includes at least one device for chemically treating the gas emerging from the recombination device, this at least one device being located after the gas recombination (10) device.

27. Thermal destruction device as in the previous claim, characterised in that the at least one device for chemically treating the gas emerging from the recombination device carries out a reaction selected from de-halogenation (14), deoxidation of nitrogen oxide (16) and desulphurisation.